Claims

We claim:

1. A method for providing enhanced services in a network, said method comprising the steps of:

collecting at a first processor network topological information, the first processor being within a subnet of said network;

disseminating from said first processor to said subnet said network topological information;

receiving at said first processor a request for service, other than a request to route a message on said network, from a second processor not in said subnet; and

providing from said first processor a response to said request for service, responsive to said network topological information.

2. A method as in claim 1, wherein said network topological information comprises information about paths and routes, including bandwidth, connectivity, delay, traffic reservations, and administrative policies applicable to those paths and routes.

3. A method as in claim 1, further comprising the step of authenticating by said first processor said request for service.

4. A method as in claim 1, further comprising the steps of:

transmitting by said first processor an authentication challenge to said second processor;

1   receiving at said first processor an authentication response

2 by said second processor to said authentication challenge; and

3   determining by said first processor whether to provide said

4 service responsive to said authentication response.

5

6   5.   A method as in claim 1, wherein

7   said request for service comprises a server name for trans-

8 lation into a network address; and

9   said step of providing a response comprises the step of se-

10 lecting a network address responsive to said network topological

11 information.

12

13   6.   A method as in claim 1, wherein

14   said request for service comprises a server name for trans-

15 lation into a network address; and

16   said step of providing a response comprises the step of or-

17 dering a set of network addresses responsive to said network

18 topological information.

19

20   7.   A method as in claim 6, wherein said step of ordering

21 is responsive to a relative distance in the network from said

22 first processor.

23

24   8.   A method as in claim 1, wherein

25   said request for service comprises a message and a plurality

26 of destination addresses; and

27   said step of providing a response comprises the step of de-

28 livering said message to said plurality of destination addresses

29 substantially all at a common time for delivery.

9.   A method as in claim 1, wherein

said request for service comprises a message, a plurality of destination addresses, and a desired common time for delivery; and

said step of providing a response comprises the step of delivering said message to said plurality of destination addresses substantially all at said common time for delivery.

10.   A method for providing enhanced services in a network, said method comprising the steps of:

receiving at a first processor dynamic host information from a host processor coupled to said network, the first processor being within a subnet of said network;

disseminating from said first processor to said subnet said dynamic host information;

receiving at said first processor a request for service, other than a request to route a message on said network, from a second processor not in said subnet; and

utilizing by said first processor network topological information in providing a response from said first processor to said request for service, responsive to said dynamic host information.

11.   A method as in claim 10, wherein said dynamic host information is responsive to a service available at said host processor, a load on said host processor, or an administrative policy in force at said host processor.

1   12.   A method as in claim 11, wherein

2   said request for service comprises a server name for trans-

3   lation to a network address; and

4   said step of providing a response comprises the step of se-

5   lecting a set of network addresses responsive to said dynamic

6   host information.

7

8   13.   A method as in claim 11, wherein

9   said request for service comprises a server name for trans-

10   lation to a network address; and

11   said step of providing a response comprises the step of or-

12   dering a set of network addresses responsive to said dynamic host

13   information.

14

15   14.   A method as in claim 13, wherein said step of ordering

16   is responsive to a load on said host processor, or an administra-

17   tive policy in force at said host processor.

18

19   15.   A method as in claim 10, wherein said dynamic host in-

20   formation is responsive to said second processor.

21

22   16. A method for providing enhanced services in a network,

23   said method comprising the steps of:

24   collecting dynamically at a first processor network topo-

25   logical information, the first processor being within a subnet of

26   said network;

27   disseminating dynamically from said first processor to said

28   subnet said network topological information;

29

1   receiving at said first processor a request for service from

2 a second processor, the service being provided by a device cou-

3 pled to said subnet of said network; and

4   routing by said first processor said request to said device,

5 said device being selected in response to said network topologi-

6 cal information.

7

8   17. A method as in claim 16, wherein said subnet comprise a

9 subnet of communicating processors, whereby substantially all of

10 said communicating processors have access to said network topo-

11 logical information.

12

13   18. A method as in claim 16, wherein said network topologi-

14 cal information comprises dynamically-updated information about

15 paths and routes, including bandwidth, connectivity, delay, traf-

16 fic reservations, and administrative policies applicable to those

17 paths and routes.

18

19   19. A method as in claim 16, further comprising the step of

20 authenticating by said first processor said request for service.

21

22   20. A method as in claim 16, further comprising the steps

23 of:

24   transmitting by said first processor an authentication chal-

25 lenge to said second processor not in said subnet;

26   receiving at said first processor an authentication response

27 by said second processor to said authentication challenge; and

28   determining by said first processor whether to provide said

29 service responsive to said authentication response.

1

2   21. A method as in claim 16, wherein said device is se-

3 lected responsive to a relative distance in the network from said

4 first processor responding to said request.

5

6   22. A method for providing enhanced services in a computer

7 network, said method comprising the steps of:

8   receiving at a processor a message from a source on said

9 network, said message to be delivered by said processor via said

10 computer network to a destination device on said network at a

11 specified time T;

12   routing said message by said processor on said network for

13 delivery so as to be received at said destination device;

14   delaying delivery of the message by said processor to said

15 destination device before said specified time T has occurred; and

16   delivering said message by said processor via said computer

17 network to said destination device at said specified time T.

18

19   23. A method for providing enhanced services in a computer

20 network, said method comprising the steps of:

21   receiving at a processor a first message from a source on

22 said network, said first message to be delivered by said proces-

23 sor via said computer network to a destination on said network

24 upon an occurrence of an event;

25   routing said first message by said processor to said desti-

26 nation;

27   delaying delivery of the first message by said processor to

28 the destination while the event has not occurred; and

29

1   delivering said first message via said computer network to

2   said destination upon the occurrence of the event.

3

4   24.   A method as in claim 23, wherein said event is a deliv-

5   ery of a second message on said network; and

6   wherein the delivery of the first and second messages occur

7   substantially simultaneously.

8

9   25.   A method as in claim 23, wherein said event is a deliv-

10 ery of said first message to a second destination on said net-

11 work; and

12   wherein said delivery of said first message to said first

13 and second destinations occurs at substantially a same time.

14

15   26.   A method as in claim 23 wherein said event is an occur-

16 rence of a clock time.

17

18   27.   A computer system operable to provide enhanced services

19 in a network, said computer system comprising:

20   one or more processors;

21   one or more memory, wherein at least one of the processors

22 and memory are adapted for:

23   collecting at a first processor network topological in-

24 formation, the first processor being within a subnet of said net-

25 work;

26   disseminating from said first processor to said subnet

27 said network topological information;

28

29

1   receiving at said first processor a request for ser-

2 vice, other than a request to route a message on said network,

3 from a second processor not in said subnet; and

4   providing from said first processor a response to said

5 request for service, responsive to said network topological in-

6 formation.

7

8   28. A computer system as in claim 27, wherein said network

9 topological information comprises information about paths and

10 routes, including bandwidth, connectivity, delay, traffic reser-

11 vations, and administrative policies applicable to those paths

12 and routes.

13

14   29. A computer system as in claim 27, wherein at least one

15 of the processors and memory are further adapted for authenticat-

16 ing by said first processor said request for service.

17

18   30. A computer system as in claim 27, wherein at least one

19 of the processors and memory are further adapted for:

20   transmitting by said first processor an authentication chal-

21 lenge to said second processor;

22   receiving at said first processor an authentication response

23 by said second processor to said authentication challenge; and

24   determining by said first processor whether to provide said

25 service responsive to said authentication response.

26

27   31. A computer system as in claim 27, wherein

28   said request for service comprises a server name for trans-

29 lation into a network address; and

1   said step of providing a response comprises the step of se-

2   lecting a network address responsive to said network topological

3   information.

4

5   32.   A computer system as in claim 27, wherein

6   said request for service comprises a server name for trans-

7   lation into a network address; and

8   said step of providing a response comprises the step of or-

9   dering a set of network addresses responsive to said network

10 topological information.

11

12 33.   A computer system as in claim 32, wherein said step of

13 ordering is responsive to a relative distance in the network from

14 said first processor.

15

16 34.   A computer system as in claim 27, wherein

17 said request for service comprises a message and a plurality

18 of destination addresses; and

19 said step of providing a response comprises the step of de-

20 livering said message to said plurality of destination addresses

21 substantially all at a common time for delivery.

22

23 35.   A computer system as in claim 27, wherein

24 said request for service comprises a message, a plurality of

25 destination addresses, and a desired common time for delivery;

26 and

27 said step of providing a response comprises the step of de-

28 livering said message to said plurality of destination addresses

29 substantially all at said common time for delivery.

36. A computer system operable to provide enhanced services in a network, said computer system comprising:

one or more processors;

one or more memory, wherein at least one of the processors and memory are adapted for:

receiving at a first processor dynamic host information from a host processor coupled to said network, the first processor being within a subnet of said network;

disseminating from said first processor to said subnet said dynamic host information;

receiving at said first processor a request for service, other than a request to route a message on said network, from a second processor not in said subnet; and

utilizing by said first processor network topological information in providing a response from said first processor to said request for service, responsive to said dynamic host information.

37. A computer system as in claim 36, wherein said dynamic host information is responsive to a service available at said host processor, a load on said host processor, or an administrative policy in force at said host processor.

38. A computer system as in claim 37, wherein said request for service comprises a server name for translation to a network address; and

1   said step of providing a response comprises the step of se-

2   lecting a set of network addresses responsive to said dynamic

3   host information.

4

5   39.   A computer system as in claim 37, wherein

6   said request for service comprises a server name for trans-

7   lation to a network address; and

8   said step of providing a response comprises the step of or-

9   dering a set of network addresses responsive to said dynamic host

10   information.

11

12   40.   A computer system as in claim 39, wherein said step of

13   ordering is responsive to a load on said host processor, or an

14   administrative policy in force at said host processor.

15

16   41.   A computer system as in claim 36, wherein said dynamic

17   host information is responsive to said second processor.

18

19   42.   A computer system operable to provide enhanced services

20   in a network, said computer system comprising:

21   one or more processors;

22   one or more memory, wherein at least one of the processors

23   and memory are adapted for:

24   collecting dynamically at a first processor network

25   topological information, the first processor being within a sub-

26   net of said network;

27   disseminating dynamically from said first processor to

28   said subnet said network topological information;

29

1   receiving at said first processor a request for service

2   from a second processor, the service being provided by a device

3   coupled to said subnet of said network; and

4   routing by said first processor said request to said

5   device, said device being selected in response to said network

6   topological information.

7

8   43. A computer system as in claim 42, wherein said subnet

9   comprise a subnet of communicating processors, whereby substan-

10   tially all of said communicating processors have access to said

11   network topological information.

12

13   44. A computer system as in claim 42, wherein said network

14   topological information comprises dynamically-updated information

15   about paths and routes, including bandwidth, connectivity, delay,

16   traffic reservations, and administrative policies applicable to

17   those paths and routes.

18

19   45. A computer system as in claim 42, wherein at least one

20   of the processors and memory are further adapted for authenticat-

21   ing by said first processor said request for service.

22

23   46. A computer system as in claim 42, wherein at least one

24   of the processors and memory are further adapted for:

25   transmitting by said first processor an authentication chal-

26   lenge to said second processor not in said subnet;

27   receiving at said first processor an authentication response

28   by said second processor to said authentication challenge; and

29

1   determining by said first processor whether to provide said

2 service responsive to said authentication response.

3

4   47. A computer system as in claim 42, wherein said device

5 is selected responsive to a relative distance in the network from

6 said first processor responding to said request.

7

8   48. A computer system operable to provide enhanced services

9 in a computer network, said computer system comprising:

10   one or more processors;

11   one or more memory, wherein at least one of the processors

12 and memory are adapted for:

13   receiving a message from a source on said network, said

14 message to be delivered via said computer network to a destina-

15 tion device on said network at a specified time T;

16   routing said message on said network for delivery so as

17 to be received at said destination device;

18   delaying delivery of the message to said destination

19 device before said specified time T has occurred; and

20   delivering said message via said computer network to

21 said destination device at said specified time T.

22

23   49. A computer system operable to provide enhanced services

24 in a computer network, said computer system comprising:

25   one or more processors;

26   one or more memory, wherein at least one of the processors

27 and memory are adapted for:

28   receiving a first message from a source on said net-

29 work, said first message to be delivered by via said computer

1 network to a destination on said network upon an occurrence of an

2 event;

3   routing said first message to said destination;

4   delaying delivery of the first message to the destina-

5 tion while the event has not occurred; and

6   delivering said first message via said computer network

7 to said destination upon the occurrence of the event.

8

9   50. A computer system as in claim 49, wherein said event is

10 a delivery of a second message on said network; and

11   wherein the delivery of the first and second messages occur

12 substantially simultaneously.

13

14   51. A computer system as in claim 49, wherein said event is

15 a delivery of said first message to a second destination on said

16 network; and

17   wherein said delivery of said first message to said first

18 and second destinations occurs at substantially a same time.

19

20   52. A computer system as in claim 49 wherein said event is

21 an occurrence of a clock time.

22

23   53. A computer program product for providing enhanced ser-

24 vices in a network, said computer program product comprising:

25   at least one computer readable medium;

26   computer program instructions stored within the at least one

27 computer readable product configured for:

28

29

1 collecting at a first processor network topological in-
2 formation, the first processor being within a subnet of said net-
3 work;

4 disseminating from said first processor to said subnet
5 said network topological information;

6 receiving at said first processor a request for ser-
7 vice, other than a request to route a message on said network,
8 from a second processor not in said subnet; and

9 providing from said first processor a response to said
10 request for service, responsive to said network topological in-
11 formation.

12

13 54. A computer program product for providing enhanced ser-
14 vices in a network, said computer program product comprising:

15 at least one computer readable medium;

16 computer program instructions stored within the at least one
17 computer readable product configured for:

18 receiving at a first processor dynamic host information
19 from a host processor coupled to said network, the first proces-
20 sor being within a subnet of said network;

21 disseminating from said first processor to said subnet
22 said dynamic host information;

23 receiving at said first processor a request for ser-
24 vice, other than a request to route a message on said network,
25 from a second processor not in said subnet; and

26 utilizing by said first processor network topological
27 information in providing a response from said first processor to
28 said request for service, responsive to said dynamic host infor-
29 mation.

55. A computer program product for providing enhanced services in a network, said computer program product comprising:

at least one computer readable medium;

computer program instructions stored within the at least one computer readable product configured for:

collecting dynamically at a first processor network topological information, the first processor being within a sub-net of said network;

disseminating dynamically from said first processor to said subnet said network topological information;

receiving at said first processor a request for service from a second processor, the service being provided by a device coupled to said subnet of said network; and

routing by said first processor said request to said device, said device being selected in response to said network topological information.

56. A computer program product for providing enhanced services in a computer network, said computer program product comprising:

at least one computer readable medium;

computer program instructions stored within the at least one computer readable product configured for:

receiving at a processor a message from a source on said network, said message to be delivered by said processor via said computer network to a destination device on said network at a specified time T;

1   routing said message by said processor on said network

2 for delivery so as to be received at said destination device;

3   delaying delivery of the message by said processor to

4 said destination device before said specified time T has oc-

5 curred; and

6   delivering said message by said processor via said com-

7 puter network to said destination device at said specified time

8 T.

9

10   57. A computer program product for providing enhanced ser-

11 vices in a computer network, said computer program product com-

12 prising:

13   at least one computer readable medium;

14   computer program instructions stored within the at least one

15 computer readable product configured for:

16   receiving at a processor a first message from a source

17 on said network, said first message to be delivered by said proc-

18 essor via said computer network to a destination on said network

19 upon an occurrence of an event;

20   routing said first message by said processor to said

21 destination;

22   delaying delivery of the first message by said proces-

23 sor to the destination while the event has not occurred; and

24   delivering said first message via said computer network

25 to said destination upon the occurrence of the event.

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1   58. An apparatus for providing enhanced services in a net-
2   work, said apparatus comprising:

3   means for collecting and disseminating network topological
4   information by a first processor within a subnet of said network;

5   means for receiving at said first processor a request for
6   service, other than a request to route a message on said network,
7   from a second processor not in said subnet; and

8   means for providing a response from said first processor to
9   said request for service, responsive to said network topological
10   information.

11

12   59. An apparatus for providing enhanced services in a net-
13   work, said apparatus comprising:

14   means for receiving at a first processor dynamic host infor-
15   mation from a host processor coupled to said network, the first
16   processor being within a subnet of said network;

17   means for disseminating from said first processor to said
18   subnet said dynamic host information;

19   means for receiving at said first processor a request for
20   service, other than a request to route a message on said network,
21   from a second processor not in said subnet; and

22   means for utilizing by said first processor network topo-
23   logical information in providing a response from said first proc-
24   essor to said request for service, responsive to said dynamic
25   host information.

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1   60. An apparatus for providing enhanced services in a net-

2 work, said apparatus comprising:

3   means for collecting dynamically at a first processor net-

4 work topological information, the first processor being within a

5 subnet of said network;

6   means for disseminating dynamically from said first proces-

7 sor to said subnet said network topological information;

8   means for receiving at said fist processor a request for

9 service from a second processor, the service being provided by a

10 device coupled to said subnet of said network; and

11   means for routing by said first processor said request to

12 said device, said device being selected in response to said net-

13 work topological information.

14

15   61. An apparatus for providing enhanced services in a com-

16 puter network, said apparatus comprising:

17   means for receiving a message at a processor from a source

18 on said network, said message to be delivered by said processor

19 via said computer network to a destination device on said net-

20 work at a specified time T;

21   means for routing said message by said processor on said

22 network for delivery so as to be received at said destination de-

23 vice;

24   means for delaying delivery of the message by said processor

25 to said destination device before said specified time T has oc-

26 curred; and

27   means for delivering said message by said processor via said

28 computer network to said destination device at said specified

29 time T.

1

2   62.   An apparatus for providing enhanced services in a com-

3 puter network, said apparatus comprising:

4   means for receiving a first message at a processor from a

5 source on said network, said first message to be delivered by

6 said processor via said computer network to a destination on said

7 network upon an occurrence of an event;

8   means for routing said first message by said processor to

9 said destination;

10   means for delaying delivery of the first message by said

11 processor to the destination while the event has not occurred;

12 and

13   means for delivering said first message via said computer

14 network to said destination upon the occurrence of the event.

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